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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR § 1.53(b))

Attorney Docket No.	7000-032
First Inventor or Application Identifier	Welch, James
Title	CALLING NAME CUSTOMIZATION IN A TELECOMMUNICATIONS ENVIRONMENT
Express Mail Label No.	EL555716448US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: Commissioner for Patents, Box Patent Application, Washington, DC 20231

1. [X] *Fee Transmittal Form *(e.g., PTO/SB/17)* *(Submit an original and a duplicate for fee processing)*
2. [X] Specification [Total Pages 31] *(preferred arrangement set forth below)*
   - — Descriptive title to the Invention
   - — Cross References to Related Applications
   - — Statement Regarding Fed sponsored R & D
   - — Reference to Microfiche Appendix
   - — Background of the Invention
   - — Brief Summary of the Invention
   - — Brief Description of the Drawings *(if filed)*
   - — Detailed Description
   - — Claim(s)
   - — Abstract of the Disclosure
3. [X] Drawing(s) *(35 U.S.C. 113)* [Total Sheets 3 sets of 6]
4. Oath or Declaration [Total Pages 3]
   a. [X] Newly executed (original or copy)
   b. [ ] Copy from a prior application (37 C.F.R. § 1.63(d)) *(for continuation/divisional with Box 17 completed)* ***[Note Box 5 below]***
      i. [ ] DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).
5. [ ] Incorporation By Reference *(useable if Box 4b is checked)* The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
6. [ ] Microfiche Computer Program *(Appendix)*
7. Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all necessary)*
   a. [ ] Computer Readable Copy
   b. [ ] Paper Copy (identical to computer copy)
   c. [ ] Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

8. [X] Assignment Papers (cover sheet & document(s))
9. [X] 37 C.F.R. § 3.73(b) Statement [X] Power of Attorney *(when there is an assignee)*
10. [ ] English Translation Document *(if applicable)*
11. [ ] Information Disclosure Statement (IDS)/PTO-1449 [ ] Copies of IDS Citations
12. [ ] Preliminary Amendment
13. [X] Return Receipt Postcard (MPEP 503) *(Should be specifically itemized)*
14. [ ] *Small Entity Statement(s) [ ] Statement filed in prior application, Status still proper and desired
15. [ ] Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
16. [ ] Other: _____

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17. If a CONTINUING APPLICATION, *check appropriate box and supply the requisite information below and in a preliminary statement:*
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    Prior application information: *Examiner:* *Group/Art Unit:*

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Name (Print/Type)	Benjamin S. Withrow	Registration No. (Attorney/Agent)	40,876
Signature		Date	October 25, 2000

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See 37 C.F.R. §§ 1.27 and 1.28.

TOTAL AMOUNT OF PAYMENT ($)1558.00

Complete if Known

Application Number	
Filing Date	October 25, 2000
First Named Inventor	Welch, James
Examiner Name	
Group/Art Unit	
Attorney Docket No.	7000-032

jc917 U.S. PTO 09/696125 10/25/00

METHOD OF PAYMENT (check one)

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2. ☒ Payment Enclosed:
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FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
101	710	201	355	Utility filing fee	710.00
106	320	206	160	Design filing fee	
107	490	207	245	Plant filing fee	
108	710	208	355	Reissue filing fee	
114	150	214	75	Provisional filing fee	

SUBTOTAL (1) ($)710.00

2. EXTRA CLAIM FEES

	Extra Claims		Fee from below		Fee Paid
Total Claims	56	-20** = 36	X 18.00	=	648.00
Independent Claims	5	-3** = 2	X 80.00	=	160.00
Multiple Dependent Claims				=	

** or number previously paid, if greater; For Reissues, see below

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	80	202	40	Independent claims in excess of 3
104	270	204	135	Multiple dependent claim
109	80	209	40	**Reissue independent claims over original patent
110	18	210	9	**Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($)808.00

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examination action	
115	110	215	55	Extension for reply within first month	
116	390	216	195	Extension for reply within second month	
117	890	217	445	Extension for reply within third month	
118	1,390	218	695	Extension for reply within fourth month	
128	1,890	228	945	Extension for reply within fifth month	
119	310	219	155	Notice of Appeal	
120	310	220	155	Filing a brief in support of an appeal	
121	270	221	135	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive - unavoidable	
141	1,240	241	620	Petition to revive - unintentional	
142	1,240	242	620	Utility issue fee (or reissue)	
143	440	243	220	Design issue fee	
144	600	244	300	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Petitions related to provisional applications	
126	240	126	240	Submission of Information Disclosure Stmt.	
581	40	581	40	Recording each patent assignment per property (times number of properties)	40.00
146	710	246	355	Filing a submission after final rejection (37 CFR §1.129(a))	
149	710	249	355	For each additional invention to be examined (37 CFR §1.129(b))	

Other fee (specify) _____

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($)40.00

SUBMITTED BY				Complete (if applicable)	
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Signature				Date	October 25, 2000

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UNITED STATES PATENT APPLICATION FOR GRANT OF LETTERS PATENT

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Express Mail Label No. EV 045 045 165 US

CALLING NAME CUSTOMIZATION IN A TELECOMMUNICATIONS ENVIRONMENT

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Docket No. 7000-032

CALLING NAME CUSTOMIZATION IN A TELECOMMUNICATIONS ENVIRONMENT

Field of the Invention

The present invention relates to enhanced telecommunications network features, and particularly relates to improving the usability of caller identification services.

Background of the Invention

Modern telecommunications systems carry telecommunications traffic based on routing and control information that is exchanged between network elements comprising, for example, the Public Switched Telephone Network (PSTN). As these communication networks have evolved, so has the sophistication of their underlying signaling and control networks. Examples of telecommunications network signaling systems include Common Channel System Signaling No. 7 (SS7), an International Telecommunications Union Standard, and advanced intelligent networks (AIN) signaling. SS7, for example, provides a basis for call setup, management, and tear down. Of more concern to telecommunications system users, such signaling systems provide enhanced calling features.

Capitalizing on the network intelligence provided by SS7 or other types of network signaling implementations, telecommunication service providers are able to offer individual users the ability to interact with the telecommunications environment and control certain aspects of its operation. For example, individual users can selectively redial the number of the last incoming call, temporarily forward calls to a selected number, and with the right equipment, determine a caller's identity

at a glance without having to pick up the phone. This last feature, that is the telecommunication network's ability to provide calling party information to the called party before the called party actually answers the phone, which has found broad everyday use.

Indeed, caller identification services have proven to be one of the most popular calling feature enhancements available. Generally referred to as "caller ID," calling identification services involve the delivery of a calling party's dialable number (DN), and optionally the calling party's name, to a called party. Oftentimes, the caller ID services are referred to as calling number delivery (CND) and calling name delivery (CNAM), respectively. With caller ID, information relating to the subscriber line originating the call travels, via some form of signaling system, through the telecommunications network, and is provided to the called party's premises equipment (e.g., telephone) by the Central Office or local exchange switch that serves the called party.

Delivery of the calling party's name is particularly useful in that it provides a more natural way for called parties to determine the identify of calling parties. Simply put, delivering the calling party's name obviates the need for the called party to mentally associate the incoming number with a particular name. Regardless of the type of network signaling system involved, the calling party identification information generally comes from some form of subscriber database, such as directory listing information. Thus, the name associated with a given calling subscriber's line by the telecommunications service provider is usually the name delivered to parties called by that given subscriber. This CNAM information is fixed in the sense that the telecommunications network

providing the CNAM information for a given calling subscriber does not change or alter the information, providing the same name information for each call placed through a given subscriber line.

Limitations of existing CNAM delivery options are apparent. For example, a single telephone line is oftentimes registered to only one or two subscribers, but is associated with multiple users. A telephone serving a college dormitory room represents a common example of this type of situation. In the dormitory room scenario, each roommate likely calls a different group of friends and associates from the same telephone, leaving whatever CNAM information that is provided to parties called from that phone of questionable value, since the subscriber name associated with the telephone is fixed regardless of who is actually placing the call. Other examples, such as a residential service telephone shared by multiple family members, highlight essentially the same problem with existing CNAM delivery systems.

Even when the calling party is the subscriber associated with the phone line by the telecommunications service provider, the subscriber may desire the flexibility to change CNAM information depending upon whom he or she is calling. This desire is easily understood by contrasting the CNAM information appropriate for a business or formal call versus the information appropriate for a call placed to a friend or family member.

Accordingly, there remains a need for improvements to caller identification services that allow individual telephone users to adjust the calling name information provided to call recipients. Ideally, these improvements would include provisions for insuring that such custom or

programmable calling name information capability is used responsibly and only in appropriate contexts.

Summary of the Invention

The present invention enables the delivery of customizable calling party identification information within a telecommunications network. Calling party information delivered to the telecommunications network for calls placed from the subscriber line can be changed depending upon the number dialed, or can be set to a persistent desired value, which can later be changed again. In one embodiment, one or more lists (screen lists) of dialable numbers are identified in association with the subscriber line, with each of the lists being associated with a desired calling name. A call placed to any number appearing in one of the lists causes the calling party name information to be set to the corresponding desired value. Feature codes, as can be activated by dialing special numeric codes using customer premises equipment (CPE) associated with the subscriber line, may also be used to select and set the desired calling name for a single call, or for all calls until changed again.

When screen lists are used, the local exchange switch preferably has access to the screen lists associated with the subscriber line. Thus, the local exchange switch determines if a number dialed through the subscriber line is one for which calling party name customization is desired. If so, the local exchange switch may access locally or remotely stored name information to get the particular custom name desired for delivery in association with calls placed to the particular number dialed. The name information may be part of a larger subscriber database and can be included

in the local exchange switch, or accessed remotely through the telecommunications network, using, for example, SS7 or AIN signaling protocols. Alternatively, the local exchange switch may have some other type of communications link with the database.

In one embodiment, the local exchange switch receives a defined numeric code from the CPE associated with the subscriber line, and this causes the local exchange switch to use a custom name value. The custom name value may be used just for that call, or may be used until changed or reset. The feature code may provide selection information such that the local exchange switch can determine which one of a number of predefined names are desired for use with the subscriber line. In this scenario, the predefined custom names are preferably stored data within the local exchange switch, or are accessible to the local exchange switch via the telecommunications network. Alternatively, the CPE may provide custom name information in association with the feature code, such that the local exchange switch receives not only the activation command, but the calling name custom value from the CPE as well. If the CPE provides the custom name information, it is preferable that the CPE have the ability to receive one or more custom names as input by a user of the CPE.

The ability to program custom names through the CPE may be an intrinsic capability of the CPE, or may be enabled in the CPE based on interaction with the local exchange switch, such as when the CPE is ADSI-compliant, and an ADSI server is associated with the local exchange switch. The utility of custom name programmability is useful in the context of both feature code-based and screen list-based custom name editing. The present invention contemplates a variety of ways for allowing

users associated with the subscriber line to define desired custom name values. These methods include programming via the CPE, using visual menus if the CPE has a data display, or otherwise through voice menu systems. Other methods are available and include allowing subscribers to set custom name information by using PCs or other Internet access appliances to gain access to a Web server having custom name editing capabilities. Manual data entry may also be used to simply update stored information relating to custom names based on information received from the subscriber.

The present invention also provides for screening custom name values to ensure that no subscribers attempt to configure their calling party name information inappropriately. Such screening is ideally done at the time that the desired custom name value is entered, which is typically in advance of any call that might trigger use of the custom name value. Screening may be done in the CPE, the local exchange switch, or in another processing system associated with the telecommunications network, or in any combination thereof. If necessary, screening may be done at the time of call processing during an active telecommunications call. However, this may have the disadvantage of adding additional call processing time.

The present invention also provides the ability to customize calling party number information in certain instances. While the potential to abuse this feature in a way that defeats the underlying value of calling party identification information is present, customizable number information may have significant value within a private exchange where it may be desirable to associate calls placed from different subscriber lines with a common number. There are other circumstances and

instances where it may be desirable to allow users to adjust subscriber line calling number identification information. Other aspects and features of the present invention will become apparent to those ordinarily skilled in the art upon review of the following description of exemplary embodiments of the invention in conjunction with the accompanying figures.

Brief Description of the Drawing Figures

Figure 1 illustrates a simplified exemplary telecommunications system in which the present invention may be advantageously practiced.

Figure 2 provides simplified flow logic for list-based selective calling party identification information customization according to one embodiment of the present invention.

Figure 3 illustrates an exemplary variation of the telecommunications system of Figure 1.

Figure 4 provides simplified flow logic for feature-code-based custom calling party identification information selection according to one embodiment of the present invention.

Figure 5 provides simplified flow logic for an exemplary variation of the logic of Figure 4.

Figure 6 provides a simplified illustration of an exemplary local exchange switch for use in the telecommunications systems of Figures 1 and 3.

Detailed Description of the Preferred Embodiments

Figure 1 illustrates a simplified telecommunications system 10 in which an exemplary embodiment of the present invention may be advantageously practiced. A local exchange switch 12, such as might be found in a telecommunications Central Office (CO), connects a

subscriber line 14 and associated customer premises equipment (CPE) 16 to a telecommunications network 18. The local exchange switch 12 optionally includes stored data in the form of a screen list 20, and stored data in the form of a subscriber information database 22. Either or both the screen list 20 and subscriber information database 22 may reside remote from the local exchange switch 12 in association with the telecommunications network 18, however it is preferable to maintain at least the subscriber's screen list 20 in the local exchange switch 12. While not illustrated to preserve clarity, the local exchange switch 12 typically supports a large number of individual subscriber lines 14.

In support of caller identification services, the local exchange switch 12 provides the telecommunications network 18 with calling party identification information associated with the subscriber line 14 for calls placed via the CPE 16. Typically, this calling party identification information includes a fixed subscriber name value and a fixed dialable number value that have been assigned to the subscriber line 14 by a telecommunications service provider. With the present invention, individual subscribers can customize at least a portion of this calling party dedication information. In some embodiments, such customization is enabled using screen lists 20 and subscriber information databases 22.

Figure 2 illustrates simplified logic associated with a screen list-based implementation for the network architecture of Figure 1. While the simplified logic illustrated focuses on customization of calling name information, it should be understood that the logic shown may be additionally or alternatively applied to customization of calling number information. However, given the potential for abuse, it may be preferable to

limit calling number customization to special circumstances. Circumstances appropriate for calling number customization are discussed below.

Processing begins (block 100) when a user dials a number using the CPE 16. The dialed number is received by the local exchange switch 12 through the subscriber line 14 (block 102). The local exchange switch 12 compares the dialed number with the appropriate entries in the screen list 20 (blocks 104 and 106). While a screen list 20 may contain other information, its utility with respect to the present invention derives from its inclusion of one or more lists of dialable numbers for which the subscriber associated with the subscriber line 14 desires customized calling party identification information.

For example, the subscriber may provide the telecommunications service provider associated with the local exchange switch 12 with five different dialable numbers (or groups of numbers) for which a different calling party name is desired. In this case, the screen list 20 would include entries for the five different dialable numbers (or groups of numbers), and could include the custom name information, although such information may be more conveniently stored in the subscriber information database 22. Thus, using the screen list 20, the local exchange switch 12 determines if the dialed number matches any numbers in the screen list 20 for which custom name information is defined.

If a match exists between the number dialed and a number stored in the screen list 20 (block 108), the local exchange switch 12 gets the custom name information corresponding to the matching stored number in the screen list 20 (blocks 110 and 112). As noted, the custom name information is preferably stored in the subscriber

information database 22, which may be resident in the local exchange switch 12, or the local exchange switch 12 may remotely query the subscriber information database 22. Various techniques provide for remote querying, and include SS7-based network signaling and AIN-based signaling. These and other remote database access techniques will be readily understood by those skilled in the art.

Once the custom name information has been retrieved (block 110), the local exchange switch 12 adjusts the calling party identification information to reflect the custom name value (block 114). The local exchange switch 12 provides the telecommunications network 18 with a calling party identification message for the call being originated from the subscriber line 14 (block 116) and processing ends (block 120). Ideally, the calling party identification message includes a generic name parameter, along with fixed name and number parameters, and optionally includes a generic number parameter. In implementing calling party name customization, the local exchange switch 12 adjusts the generic name parameter to a desired value, while leaving the fixed name and number parameters unaltered. This allows the telecommunications network 18 to maintain accurate call records based on fixed information associated with the subscriber line 14, while allowing called parties to receive the custom name information contained in the generic name parameter.

If no match exists between the number dialed and the numbers contained in the screen list 20 (block 108), the local exchange switch 12 maintains either the current calling party identification message, or uses a default calling party identification message (block 118). The default calling party name will generally be the fixed name value included in the calling party identification

message as explained above. Those skilled in the art will recognize opportunities exist for varying the logic associated with resetting the generic calling name parameter to a default value, a null value, or preserving its current custom setting.

With the present invention, callers can change their calling name as desired. For example, college roommates sharing a single telephone line may set the calling name when making a call in order to allow the receiving party to recognize who is calling. This is particularly useful the roommates that are not the subscribers on record at the telephone company. Alternatively, home based businesses sharing a telephone line for residential and business purposes can set the calling name for the business for business calls and set the calling name as the family name for personal calls.

Figure 3 illustrates an exemplary variation of the simplified telecommunications system 10 introduced in Figure 1. Rather than using a screen list 20 to determine when customized calling party dedication information is desired for a given call originated from the subscriber line 14, calling party identification information customization is controlled by feature codes and, optionally, name messages received from the CPE 16. Those skilled in the art will readily appreciate the use of other feature codes in existing telecommunications systems to enable enhanced calling services like automatic callback (e.g., dialing "*69"). Depending upon how supporting feature codes are implemented, calling party identification information customization may still use the subscriber information database 22, may use a private database 24 within the CPE 16, or may not rely on databases for storage of custom identification information at all.

While Figures 4 and 5 illustrates two of the numerous variations available with feature code control of custom calling party dedication information, it should be noted that feature code functionality may be combined with screen list-based calling party identification information customization for even greater flexibility in implementing the present invention. Further, Figures 4 and 5 are discussed in light of the architecture of Figures 1 or 3. Figure 4 illustrates an embodiment where feature codes received from the CPE 16 control calling party identification information customization.

Processing begins (block 200) with the local exchange switch 12 determining whether it has received a customization feature code in association with a call being placed from the CPE 16 connected to the subscriber line 14 (block 202). Preferably, the feature code is augmented with additional selection information sufficient to allow the local exchange switch 12 to identify a desired custom name value if multiple custom values have been defined for the subscriber line 14 (blocks 204 and 206). This might, for example entail receiving a feature code plus an additional numeric code corresponding to a specific custom name value stored in the subscriber information database 22.

Processing continues with the local exchange switch 12 adjusting the custom name portion of the calling party identification message to reflect the desired custom name information (block 208). The local exchange switch 12 then provides the calling party identification message to the telecommunications network 18 as part of its call completion operations (block 210) and processing ends (block 214). If the customization feature code is not received in association with the call (block 202), the

local exchange switch 12 maintains the current or default identification message information (block 212).

Figure 5 illustrates a variation of the simplified logic introduced in Figure 4. Processing begins (block 300) with the local exchange switch 12 determining whether it has received a customization feature code from the CPE 16 connected with the subscriber line 14 (block 302). In contrast with the logic of Figure 4, where the customization information was stored in the local exchange switch 12 or elsewhere in the telecommunications network 18, customization information in this embodiment is stored in the private database 24 and received from the CPE 16 (block 304). The customization information received from the CPE 16 may be a custom name, a custom number, or any combination thereof. Additionally, the feature codes may be used to indicate whether the customized settings should be persistent (i.e., used for subsequent calls), or simply applied to the current or next call. Software within the local exchange switch 12 may also provide functionality related to setting the persistence of customization settings for the calling party identification information in all embodiments of the present invention.

As alluded to earlier, the present invention may include customization of calling number information as well, but with consideration for the need to limit such customization to environments where its use is appropriate and not subject to abuse. In some environments, the local exchange switch 20 may serve as a private exchange for a group of subscriber lines 14. An example of this might be a company with a primary business number and a plurality of additional numbers associated with the phone system extensions assigned to individual employees. In these circumstances, it may be

desirable to have the calling number identification information for outgoing calls placed from the individual extensions adjusted to the primary business number. Also, an employee working at a temporary extension may wish to temporarily preprogram the extension so that their name (and possibly, their normal extension number) is included in the calling party identification information sent for calls placed from the temporary extension. In the context of Figure 5, an employee could simply pick up a given extension handset (not shown) and use a feature code to temporarily change the name and number identification information for that extension. Of course, the utility of these capabilities extend to environments other than just work environments, and may be combined with other embodiments of the present invention.

After the local exchange switch 12 receives the custom calling party identification information (name and/or number) from the CPE (block 304), the local exchange switch 12 optionally performs screening of the received information (block 306) to ensure that the custom information received is not inappropriate. This screening step may be employed in any of the embodiments of the present invention, and may take on a variety of forms, as those skilled in the art will readily appreciate. As noted, screening may be performed as a part of call processing, however this may undesirably increase the length of time required to complete a call.

Preferably, custom value screening is performed at the time of entry. Screening may be performed in the CPE 16, the local exchange 12, or associated processing systems in the telecommunications network 18, or in any combination thereof. Once optional screening is complete, the local exchange switch 12 adjusts the custom

parameters in the calling party identification message for which customization is desired (block 308). The customized calling party identification message is provided to the telecommunications network 18 by the local exchange switch 12 (block 310) and processing ends (block 314). If no customization feature code was received by the local exchange switch 12 (block 302), the local exchange switch 12 maintains the current or default calling party identification message information (block 312), and processing ends (block 314).

A variety of methods exist for getting desired custom calling party identification information to the local exchange switch 12. By example, the information may come from data storage within or associated with local exchange switch 12, or may come from data storage accessible via the telecommunications network 18, or may come from the CPE 16. The co-pending Application Serial No. 09/643,510, entitled *System and Method of Controlling Calling Party Information Delivery* and commonly assigned with the instant application, relates to enhancing delivery control of calling party identification information and provides examples of how subscribers may access and edit data items such as screen lists 20 and subscriber information databases 22, and is incorporated herein by reference.

Figure 6 illustrates the simplified architecture of an exemplary embodiment of the local exchange switch 12 discussed above. The architecture illustrated for the local exchange switch 12 is a simplified representation of a DMS-100 local exchange switch. The DMS-100 is manufactured by Nortel Networks Limited, having a business address at World Trade Center of Montreal, 380 St. Antoine Street West, Montreal, Quebec. A typical DMS-100 implementation includes a computing module 26 and

supporting software 28. The software 28 includes program instructions supporting overall operation of the DMS-100, and provides functionality for enhanced calling services. The screen list 20 and the database 22 may be included in the DMS-100 in association with the computing module 26 and software 28. A "switching fabric" module 30 interfaces a plurality of subscriber lines 14 (telephony lines) to the network 18 via a subscriber line interface 32 and a network interface 34. The DMS-100 further includes an operations/administration & maintenance module 36.

In one embodiment, the DMS-100 includes storage elements configured to hold the screen list 20 and the database 22, in or associated with the computing module 26. In such configurations, the DMS-100 has local access to customized CID information for connected subscribers. In other configurations, the DMS-100 may access a remote database 22 for at least a portion of the custom CID information. The switching fabric module 30 may comprise logical and physical switches for interconnecting the subscriber lines 14 with the telecommunications network 18 through the subscriber line and network interfaces 32 and 34, respectively. The operations/maintenance & administration module 36 provides an interface for select service and upgrade activities.

DMS-100 local switching systems support the Common Channel Signaling Interface No. 7, which is compatible with SS7 standards, and are available with a variety of software options supporting a variety of advanced calling features. While not critical to understanding the present invention, detailed operations for each of these elements are thoroughly explained in various service and product manuals available from Nortel Networks Corporation.

However, it should be understood that the features and capabilities imparted by the present invention are not dependent upon a particular organization or structure for the local exchange switch 12, the CPE 16, or the telecommunications network 18. It is sufficient that the telecommunications network 18 support the delivery of some form of caller identification information messages that may be selectively edited to reflect custom name and number values as defined by or in association with the individual subscribers for their respective subscriber lines.

Those skilled in the art will readily appreciate that the present invention permits substantial variation in terms of implementation. The foregoing discussion and accompanying drawings explain and illustrate exemplary embodiments of the present invention but should not be construed as limiting the scope of the present invention. In general, the present invention relates to allowing telecommunications system subscribers and users in general to define custom calling party identification information, and to control when and how such custom information is used. Thus, the scope of the present invention is limited only by the scope of the claims included herein, and the reasonable equivalents thereof.

Claims

What is claimed is:

1. A method of providing custom calling party identification (CID) information, the method comprising:

determining that customized CID information is desired for a call originating from an originating end-point; and

providing the customized CID information in association with the call;

wherein a device receiving the call can receive the customized CID information.

2. The method of claim 1 wherein the step of determining comprises determining whether a number dialed for the call matches a stored number associated with the origination end-point.

3. The method of claim 2 wherein the stored number is associated with custom CID information, and wherein the step of providing comprises:

setting a CID message in accordance with the custom CID information; and

transmitting the CID message as the customized CID information.

4. The method of claim 3 wherein the custom CID information includes at least one of a custom name value and a custom number value, and wherein the step of setting comprises setting at least one of a generic name portion and a generic number portion in the CID message to the custom name and number values, respectively.

5. The method of claim 4 further comprising maintaining fixed CID information in the CID message uniquely identifying the origination end-point for call record purposes.

6. The method of claim 2 wherein at least one list of stored numbers is associated with the origination end-point, each of the at least one list having corresponding custom CID information, and wherein the step of providing comprises:

setting a CID message in accordance with the custom CID information corresponding to one of the at least one lists of stored numbers having a matching number with respect to the number dialed; and

transmitting the CID message.

7. The method of claim 6 wherein the least one list of stored numbers is stored in a local exchange switch associated with the origination end-point, and further comprising accessing a database to retrieve custom CID information if a match exists between the number dialed and one of the at least one list of stored numbers.

8. The method of claim 7 wherein the step of accessing the database comprises accessing a local database associated with the local exchange switch.

9. The method of claim 7 wherein the step of accessing the database comprises accessing a remote database associated with a telecommunications network.

10. The method of claim 9 wherein the step of accessing the remote database comprises using SS7 signaling to access and query the remote database.

11. The method of claim 9 wherein the step of accessing the remote database comprises using advanced intelligent network signaling to access and query the remote database.

12. The method of claim 10 wherein the step of accessing the remote database comprises using Internet Protocol signaling to access and query the remote database through the Internet.

13. The method of claim 1 wherein the step of determining comprises receiving a feature code indicating a desire for the customized CID information from customer premises equipment (CPE) associated with the origination end-point.

14. The method of claim 1 wherein the step of determining comprises receiving a feature code indicating a desire for the customized CID information.

15. The method of claim 13 further comprising receiving custom CID information from the CPE in association with the feature code for use in the customized CID information provided in association with the call.

16. The method of claim 13 further comprising maintaining the customized CID information for subsequent calls originated from the origination end-point until

receiving a new feature code bearing a use of changed customized CID information.

17. The method of claim 13 further comprising retrieving custom CID information from a database for use in the customized CID information in response to receiving the feature code.

18. The method of claim 1 further comprising receiving at least one desired value for use in generating the customized CID information from a user associated with the origination end-point.

19. The method of claim 18 wherein the step of receiving comprises receiving the at least one desired value in a local exchange switch associated with the origination end-point based on:

providing an interactive programming interface via customer premises equipment (CPE) associated with the origination end-point; and

entering a programming mode wherein the user enters the at least one desired value via the CPE.

20. The method of claim 19 further comprising receiving dialable number information defining at least one dialable number entered by the user via the CPE for association with the at least one desired value, wherein the user can define a plurality of groups of dialable numbers and associate respective ones of a plurality of desired values with respective ones of the plurality of groups of dialable numbers.

21. The method of claim 19 wherein the step of providing the interactive programming interface comprises downloading an ADSI script to the CPE.

22. The method of claim 18 wherein the step of receiving comprises receiving the at least one desired value in a local exchange switch associated with the origination end-point based on:

providing an Internet-accessible user interface; and

receiving the at least one desired value for the origination end-point via the Internet-accessible user interface.

23. The method of claim 22 further comprising receiving dialable number information defining at least one dialable number entered by the user via the Internet-accessible user interface for association with the at least one desired value, wherein the user can define a plurality of groups of dialable numbers and associate respective ones of a plurality of desired values with respective ones of the plurality of groups of dialable numbers.

24. The method of claim 18 wherein the step of receiving comprises receiving the at least one desired value in a local exchange switch associated with the origination end-point based on providing a voice menu system accessible via customer premises equipment (CPE) associated with the origination end-point allowing users to specify at least one desired value for the custom CID information.

25. The method of claim 24 further comprising receiving voice menu selections determining an

association between the at least one desired value and corresponding dialable numbers that can be dialed via the CPE.

26. A computer readable media comprising software for instructing a telecommunications computer system to:

determine that customized CID information is desired for a call originating from an origination end-point; and

provide the customized CID information in association with the call.

27. The computer readable media comprising software of claim 26 wherein the instruction to determine that customized CID information is desired comprises instructions to:

receive dialed number information for the call; and

determine whether the dialed number information matches stored number information associated with the origination end-point.

28. The computer readable media comprising software of claim 27 wherein the telecommunications computer system is a local exchange switch associated with the origination end-point and the stored number information is a screen list stored in the local exchange switch for the origination end-point, and further wherein the instruction to determine whether the dialed number information matches stored number information comprises instructions to compare the dialed number information with the stored number information in the screen list, wherein the stored number information includes at least one dialable number for which customized CID information is desired.

29. The computer readable media comprising software of claim 27 wherein the telecommunications computer system is a local exchange switch associated with the origination end-point and the stored number information matching the number dialed has at least one of a corresponding stored custom name value and a corresponding stored custom number value, and further wherein the instruction to provide the customized CID information in association with the call comprises instructions to:

retrieve at least one of the corresponding stored name and stored number values; and

transmit the customized CID information including the at least one of the corresponding stored name and stored number values.

30. The computer readable media comprising software of claim 29 wherein the instruction to retrieve at least one of the corresponding stored name and stored number values comprises instructions to access a remote database through an advanced intelligent network.

31. The computer readable media comprising software of claim 29 wherein the instruction to retrieve at least one of the corresponding stored name and stored number values comprises instructions to access a remote database through an SS7 network.

32. The computer readable media comprising software of claim 29 wherein the instruction to retrieve at least one of the corresponding stored name and stored number values comprises instructions to access a remote database through the Internet.

33. The computer readable media comprising software of claim 29 for further instructing the telecommunications computer system to:

support a user programming interface; and

receive dialable number information for storage as the stored number information from a user via the user programming interface.

34. The computer readable media comprising software of claim 33 for further instructing the telecommunications computer system to:

receive at least one of desired name and number values for storage as the corresponding stored custom name and number values.

35. The computer readable media comprising software of claim 29 for further instructing the telecommunications computer system to:

support a user programming interface via customer premises equipment (CPE) connected to the origination end-point; and

receive dialable number information for storage as the stored number information from a user via the user programming interface.

36. The computer readable media comprising software of claim 26 wherein the instruction to determine that customized CID information is desired for a call originating from an origination end-point comprises instructions to determine if a feature code corresponding to a desire for customized CID information is received in advance of the call.

37. The computer readable media comprising software of claim 36 for further instructing the telecommunications computer system to:

receive selection information in conjunction with the feature code; and

select at least one of a desired custom name value and a desired custom number value corresponding to the selection information for use in the customized CID information.

38. An apparatus facilitating provision of custom calling party identification (CID) comprising:

a means for selectively interconnecting a plurality of origination end-points in support of telecommunications functions based on dialable number information entered via individual ones of the plurality of origination end-points;

a means for determining that customized CID information is desired for a call originating from a given one of the plurality of origination end-points;

a means for determining at least one custom value for use as at least a part of the customized CID information; and

a means for transmitting the custom CID information in association with the call.

39. The apparatus of claim 38 wherein the means for determining that customized CID information is desired for a call originating from a given one of the plurality of origination end-points comprises a means for determining whether a number dialed for the call matches one in a predefined list of stored numbers.

40. The apparatus of claim 39 wherein the means for determining at least one custom value for use as at least a part of the customized CID information comprises a means for retrieving the at least one custom value from a database.

41. The apparatus of claim 38 wherein the means for determining that customized CID information is desired for a call originating from a given one of the plurality of origination end-points comprises a means for determining whether a feature code indicating a desire for the customized CID information is received in advance of the call.

42. The apparatus of claim 41 wherein the means for determining at least one custom value for use as at least a part of the customized CID information comprises a means for receiving at least one of a custom name value and a custom number value in association with the feature code received through the origination end-point.

43. The apparatus of claim 41 wherein selection information is received in association with the feature code and the means for determining at least one custom value for use as at least a part of the customized CID information comprises a means for accessing a database to retrieve the at least one custom value based on the selection information.

44. The apparatus of claim 43 wherein the means for accessing the database comprises a means for communicating with a remote database via an SS7 network.

45. The apparatus of claim 43 wherein the means for accessing the database comprises a means for communicating with a remote database via an advanced intelligent network.

46. The apparatus of claim 43 wherein the means for accessing the database comprises a means for communicating with a remote database via an internet.

47. A telecommunications local exchange switch comprising:

a first interface for connecting with a plurality of origination end-points;

a second interface for connecting with a telecommunications network;

a switching system operatively associated with the first and second interfaces for selectively interconnecting individual ones of the origination end-points, and for selectively connecting individual ones of the origination end-points with the telecommunications network; and

a controller for supporting overall operations of the telecommunications local exchange switch in accordance with program instructions and operating data;

said controller adapted to selectively provide customized CID information in association with calls originating from at least one of the plurality of origination end-points based on the program instructions and operating data.

48. The telecommunications local exchange switch of claim 47 wherein the controller selectively provides the customized CID information based on determining whether a number dialed in association with a call originating from

the at least one origination end-point matches one in a predefined list of stored numbers.

49. The telecommunications local exchange switch of claim 47 wherein the controller determines at least one custom value for the customized CID information based on retrieving the at least one custom value from a database associated with the telecommunications local exchange switch.

50. The telecommunications local exchange switch of claim 49 wherein the controller is further adapted to access the database via a SS7 network.

51. The telecommunications local exchange switch of claim 49 wherein the controller is further adapted to access the database via an internet.

52. The telecommunications local exchange switch of claim 49 wherein the controller is further adapted to access the database via an advanced intelligent network.

53. The telecommunications local exchange switch of claim 47 wherein the controller determines that the customized CID information is desired for a call originating from a given one of the plurality of origination end-points based on determining whether a feature code indicating a desire for the customized CID information is received through the origination end-point in advance of the call.

54. The telecommunications local exchange switch of claim 53 wherein the controller determines at least one custom value for the customized CID information based on

information received through a telephony line in association with the feature code.

55. The telecommunications local exchange switch of claim 53 wherein the controller determines at least one custom value for the customized CID information based on selection information received in association with the feature code that is used in accessing a database associated with the telecommunications local exchange switch to retrieve the at least one custom value.

56. A method of providing custom calling party identification (CID) information, the method comprising:

determining that customized CID information is desired for a call originating from an originating end-point;

comparing the customized caller CID information with inappropriate CID information; and

providing the customized CID information in association with the call if the customized CID information does not match the inappropriate CID information;

wherein a device receiving the call can receive the customized CID information.

Abstract

Name customization features allow users to customize calling name information provided to a telecommunications network for calls placed from their subscriber lines. A local exchange switch provides calling party identification information for an associated subscriber line to the telecommunications network. If a custom name is desired for a given call, the local exchange switch changes, if necessary, a name value in the calling party identification information to the custom value. Subscribers can identify particular numbers and corresponding desired custom names, with the local exchange switch selecting the desired name when an identified number is called. Dialing feature codes from a handset or other device also may control custom name information. When appropriate, subscribers may customize calling number information as well. Preferably, screening methods prohibit subscribers from specifying disingenuous custom information. Custom information may be set any number of ways, including via telephone handsets, or by PC via a Web-based interface. Preferably, calling party identification information provided by the local exchange switch also includes fixed identification information to maintain accurate calling records within the telecommunications network.

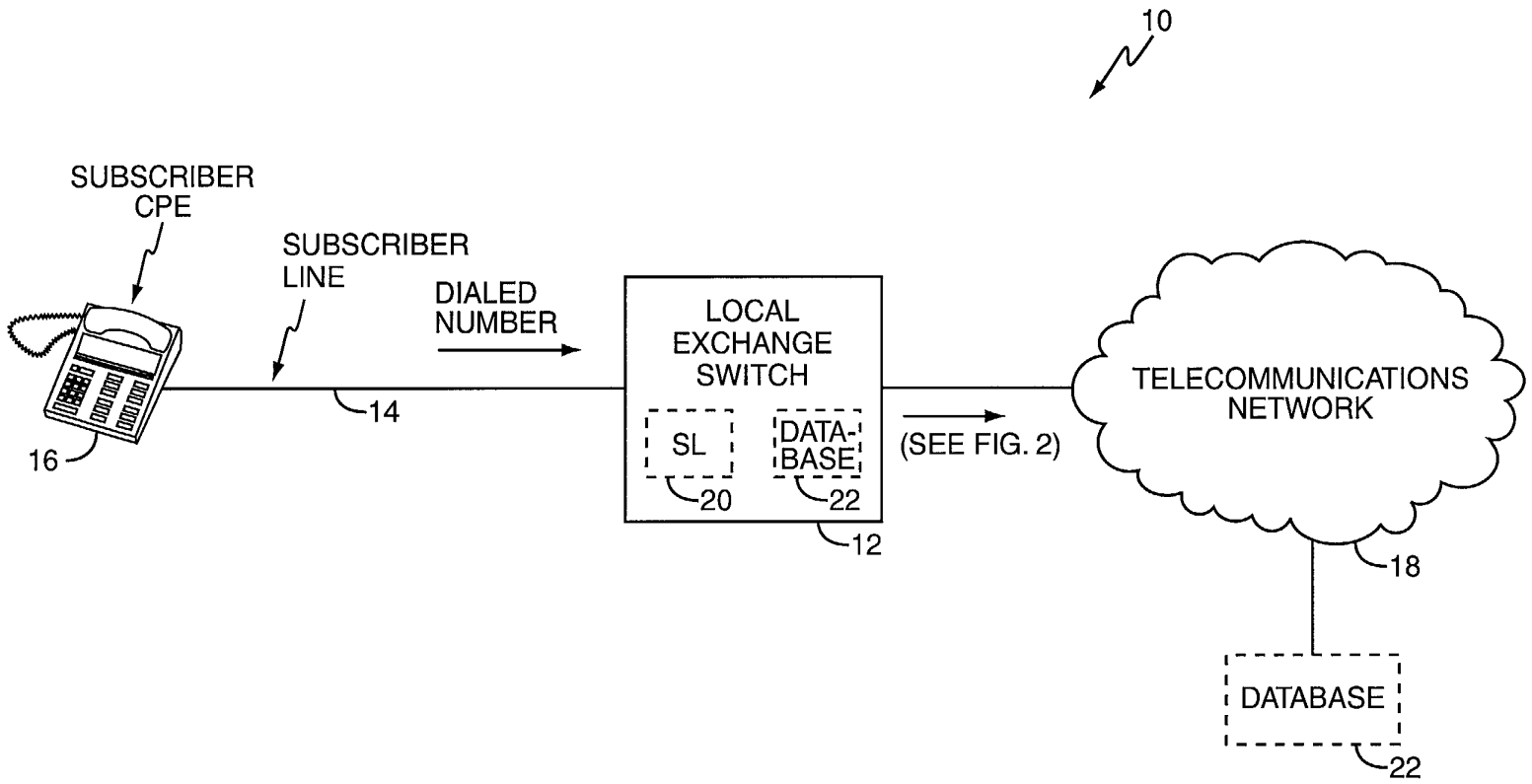
10
SUBSCRIBER CPE
SUBSCRIBER LINE
DIALED NUMBER
LOCAL EXCHANGE SWITCH
SL
DATA-BASE
20
22
12
14
16
(SEE FIG. 2)
TELECOMMUNICATIONS NETWORK
18
DATABASE
22

FIG. 1

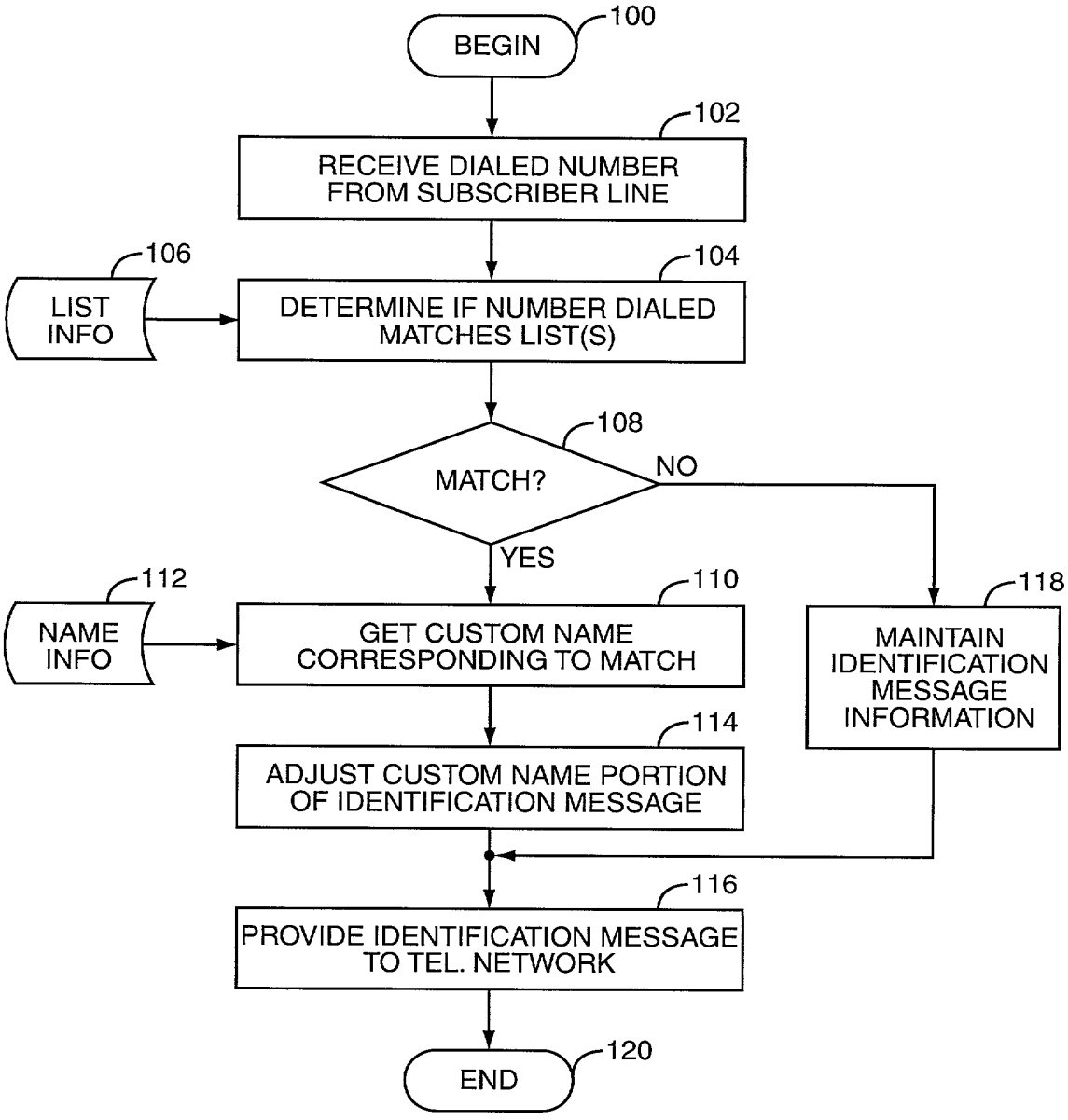
BEGIN
100
RECEIVE DIALED NUMBER FROM SUBSCRIBER LINE
102
LIST INFO
106
DETERMINE IF NUMBER DIALED MATCHES LIST(S)
104
MATCH?
108
NO
YES
NAME INFO
112
GET CUSTOM NAME CORRESPONDING TO MATCH
110
MAINTAIN IDENTIFICATION MESSAGE INFORMATION
118
ADJUST CUSTOM NAME PORTION OF IDENTIFICATION MESSAGE
114
PROVIDE IDENTIFICATION MESSAGE TO TEL. NETWORK
116
END
120

FIG. 2

[illegible]

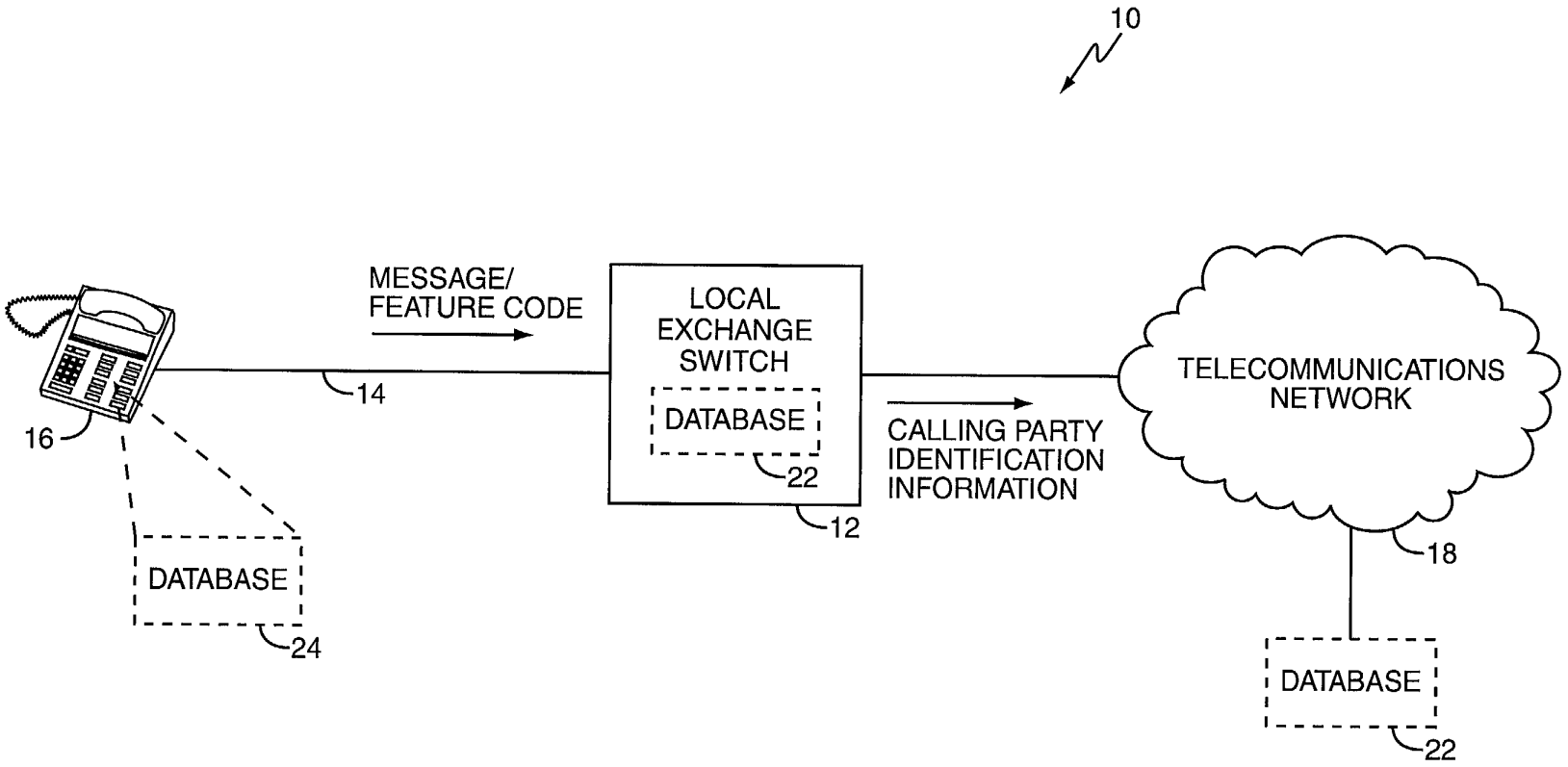
10
MESSAGE/
FEATURE CODE
LOCAL
EXCHANGE
SWITCH
DATABASE
22
12
14
16
DATABASE
24
CALLING PARTY
IDENTIFICATION
INFORMATION
TELECOMMUNICATIONS
NETWORK
18
DATABASE
22

FIG. 3

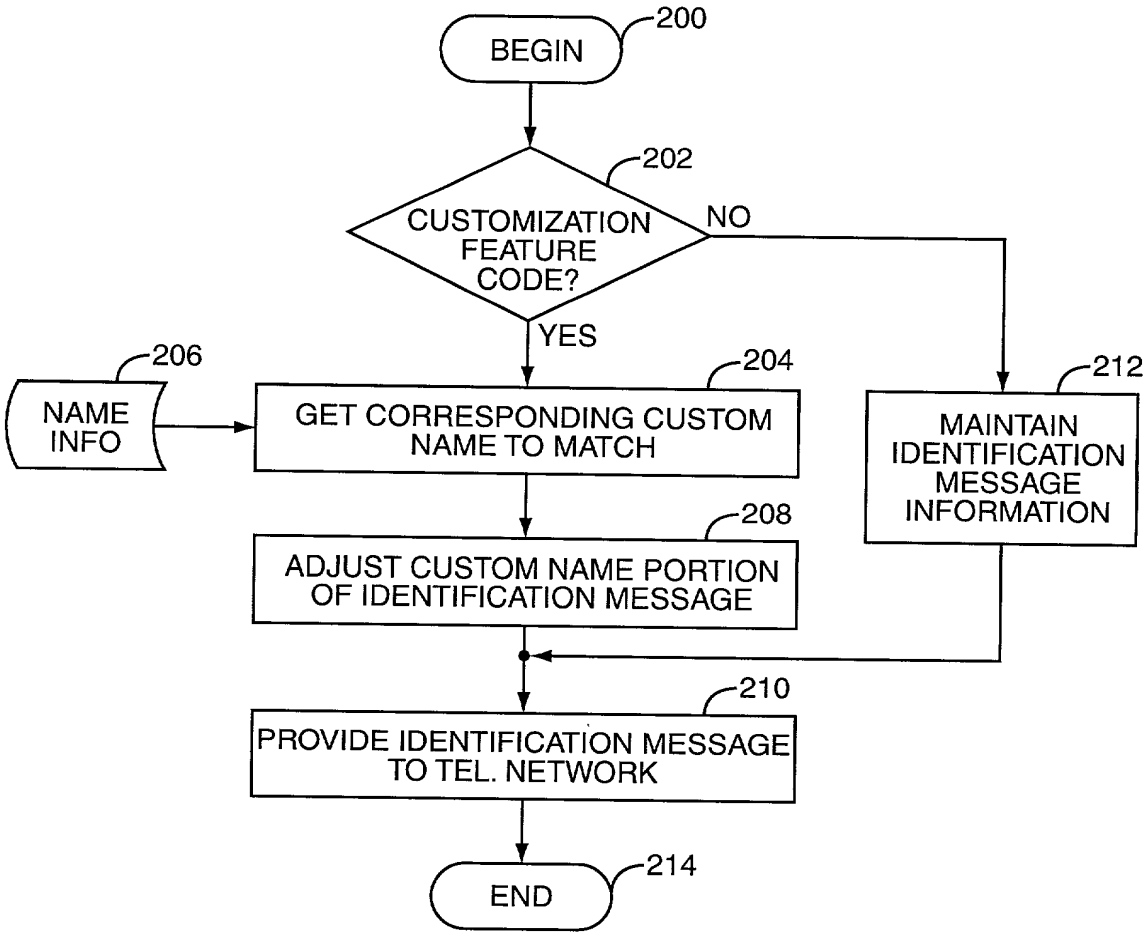
BEGIN
200
CUSTOMIZATION FEATURE CODE?
202
NO
YES
NAME INFO
206
GET CORRESPONDING CUSTOM NAME TO MATCH
204
MAINTAIN IDENTIFICATION MESSAGE INFORMATION
212
ADJUST CUSTOM NAME PORTION OF IDENTIFICATION MESSAGE
208
PROVIDE IDENTIFICATION MESSAGE TO TEL. NETWORK
210
END
214

FIG. 4

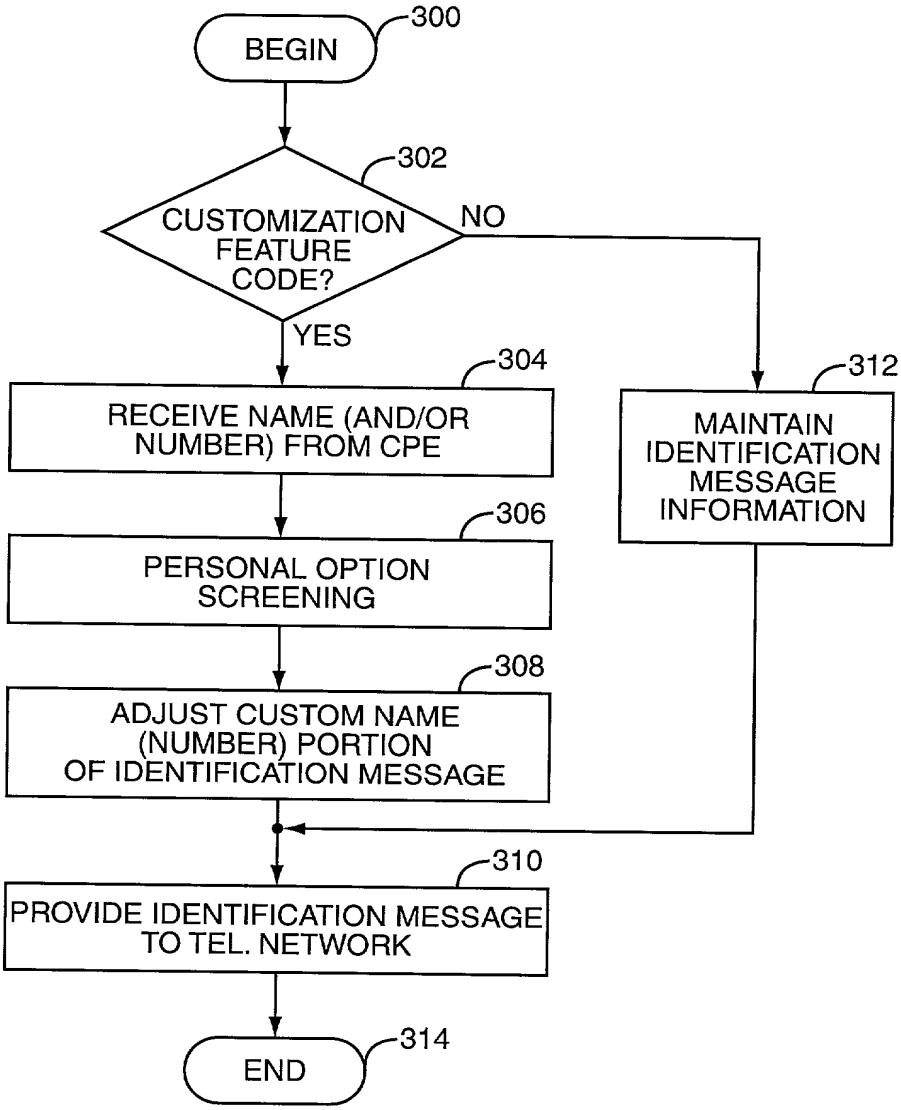
BEGIN
300
CUSTOMIZATION FEATURE CODE?
302
NO
YES
RECEIVE NAME (AND/OR NUMBER) FROM CPE
304
MAINTAIN IDENTIFICATION MESSAGE INFORMATION
312
PERSONAL OPTION SCREENING
306
ADJUST CUSTOM NAME (NUMBER) PORTION OF IDENTIFICATION MESSAGE
308
PROVIDE IDENTIFICATION MESSAGE TO TEL. NETWORK
310
END
314

FIG. 5

DRAFT - 03/06/01

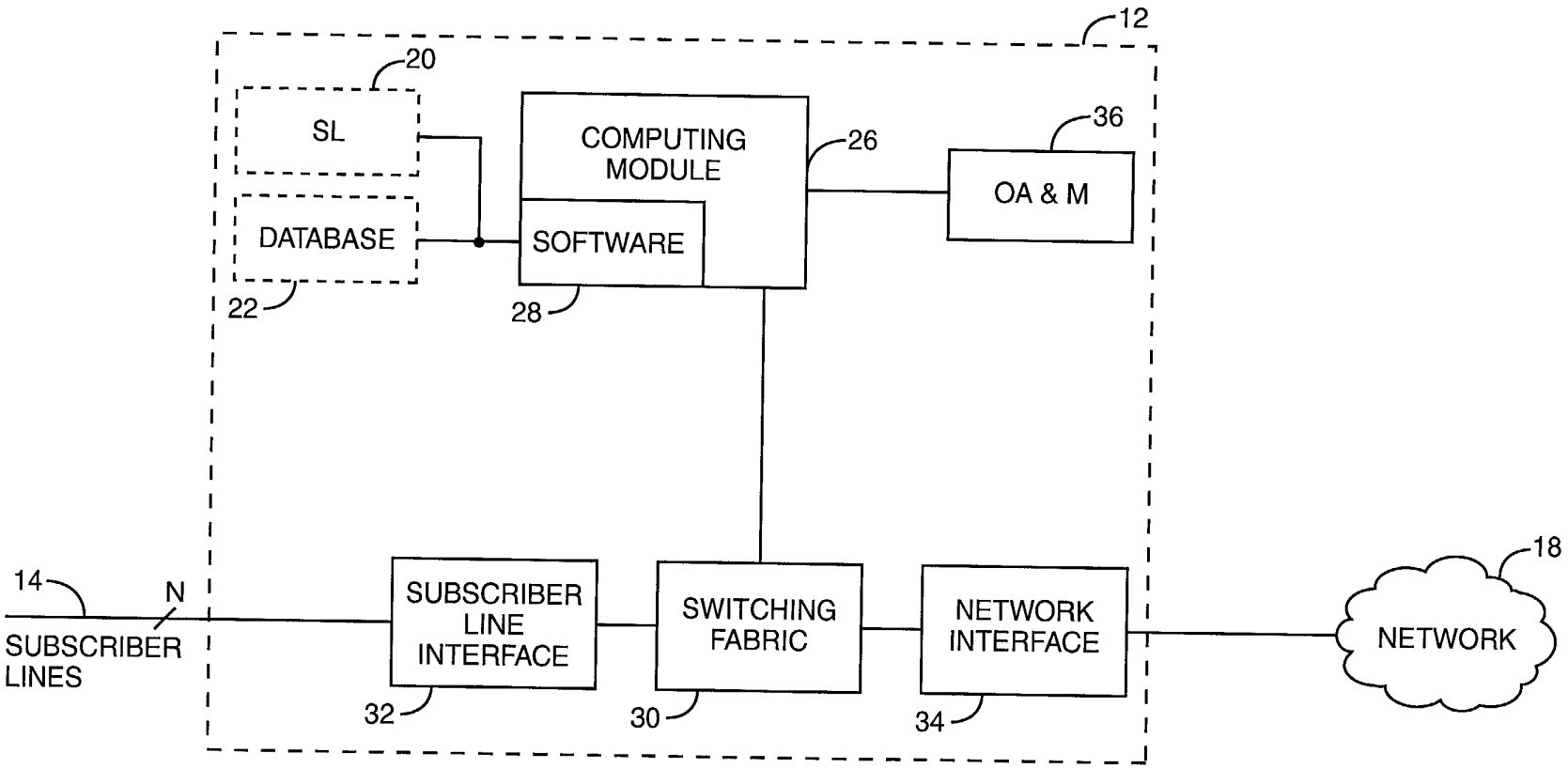

FIG. 6

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

Attorney Docket Number	7000-032
First Named Inventor	Welch, James M.
COMPLETE IF KNOWN	
Application Number	/
Filing Date	
Group Art Unit	
Examiner Name	

☒ Declaration Submitted with Initial Filing **OR** ☐ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

CALLING NAME CUSTOMIZATION IN A TELECOMMUNICATIONS ENVIRONMENT

(Title of the Invention)

the specification of which

☒ is attached hereto

OR

☐ was filed on (MM/DD/YYYY) [ ] as United States Application Number or PCT International Application Number [ ] and was amended on (MM/DD/YYYY) [ ] (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
				☐	☐
				☐	☐
				☐	☐
				☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below

Application Number(s)	Filing Date (MM/DD/YYYY)

☐ Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

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I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: ☒ Customer Number OR ☐ Registered practitioner(s) name/registration number listed below

22033 AND 24631 → Place Customer Number Bar Code Label here

Name	Registration Number	Name	Registration Number

☐ Additional registered practitioner(s) named on supplemental Registered Practitioner Information sheet PTO/SB/02C attached hereto.

Direct all correspondence to: ☒ Customer Number or Bar Code Label ondence address below

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Address					
Address					
City					
Country		Telephone		Fax	

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname
James M.	Welch

Inventor's Signature	James M Welch					Date	10-23-2000	
Residence: City	Wake Forest	State	NC	Country	USA	Citizenship	USA	
Post Office Address	1409 Tracker Trace Court							
Post Office Address								
City	Wake Forest	State	NC	ZIP	27587	Country	USA	

☒ Additional inventors are being named on the 1 supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

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ADDITIONAL INVENTOR(S)
Supplemental Sheet
Page 1 of 1

Name of Additional Joint Inventor, if any:				☐ A petition has been filed for this unsigned inventor			
Given Name (first and middle [if any])				Family Name or Surname			
Janet L.				Catts			
Inventor's Signature	Janet L Catts				**Date**	10/23/00	
Residence: City	Cary	**State**	NC	**Country**	USA	**Citizenship**	USA
Post Office Address	106 Bighorn Circle						
Post Office Address							
City	Cary	**State**	NC	**ZIP**	27513	**Country**	USA

Name of Additional Joint Inventor, if any:				☐ A petition has been filed for this unsigned inventor			
Given Name (first and middle [if any])				Family Name or Surname			
Aleeha R.				Travis			
Inventor's Signature	Aleeha R Travis				**Date**	10/23/00	
Residence: City	Wake Forest	**State**	NC	**Country**	USA	**Citizenship**	USA
Post Office Address	8912 Polbida Drive						
Post Office Address							
City	Wake Forest	**State**	NC	**ZIP**	27587	**Country**	USA

Name of Additional Joint Inventor, if any:				☐ A petition has been filed for this unsigned inventor			
Given Name (first and middle [if any])				Family Name or Surname			
Richard J.				Wood			
Inventor's Signature	Richard J Wood				**Date**	10/23/00	
Residence: City	Holly Springs	**State**	NC	**Country**	USA	**Citizenship**	USA
Post Office Address	224 Holly Green Lane						
Post Office Address							
City	Holly Springs	**State**	NC	**ZIP**	27540	**Country**	USA

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